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Abstract

In Germany self-employment among foreigners increased significantly in recent years. We study the geographical distribution of ethnic minority self-employment in Germany and find determinants for variations in start-up activities across 440 administrative German regions. We analyze the Statistic of Business Notifications and provide an extensive overview about start-up activities of foreigners in the time period 2001-2005. Moreover we apply a count data model on the number of business registrations in a particular region. We find that business foundations by foreigners are mainly enhanced by population growth, a higher population density and a large fraction of foreigners on overall population.

Keywords: Ethnic Minority Business, Entrepreneurship, Germany, Count Data Model
JEL Classification: L26, M13, C21

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1 Introduction

In Germany self-employment among ethnic minorities increased significantly in recent decades, up to about 300,000 enterprises and a self-employment quota of 11.8 % in 2005.[1] Self-employed foreigners are of growing economic importance. Projections show that about 3 % of all employees are employed in businesses owned by foreigners (Institut für Mittelstandsforschung, 2005, p. 13). Overall investment by Turkish entrepreneurs amounted to 7.4 billion Euro in 2005 (Bundesministerium für Wirtschaft und Technologie, 2006). This equals a share of 4.4 % of overall investment by small and medium enterprises. Businesses of ethnic entrepreneurs serve mainly the needs of the majority population and tend to operate on local markets.

However, up to now information about self-employment among ethnic minorities is mainly based on extrapolations of representative data and small survey samples (see Öztürk, 2001, Constant et al., 2005, Constant and Zimmermann, 2006, and Fertala, 2006). A comprehensive overview that covers all start-up activities of ethnic minorities is still missing. Moreover there is still a lack of information about the regional environment preferred by ethnic minorities for their start-up projects.

For the first time, we will present an extensive analysis of the start-up activities among ethnic minorities based on the Statistics of Business Notifications (Gewerbeanzeigenstatistik) between 2001 and 2005. Due to the obligation to register with the authorities for all businesses residing in Germany[2] our data include all start-ups of ethnic minorities in 440 German administrative regions.[3] Moreover, we investigate what causes regional variation in entrepreneurial activities of ethnic minorities and whether these determinants differ between nationalities.

To the best of our knowledge, up to now there is no study published, that focuses on regional aspects of start-up activities of ethnic minorities in Germany. Contributions about regional variations of overall entrepreneurial activities implicitly assume, that the effects of regional conditions are identical for entrepreneurs of different nationalities (see Fritsch and Falck, 2003, Wagner and Sternberg, 2004, Brixy and Grotz, 2006). This is not in accordance with the results presented here.

The following section provides an overview about theoretical literature on ethnic en-

[1] See (Federal Government, 2007, p. 89). The self-employment quota refers to the self-employed as a share of employed and self-employed persons.

[2] See §14 GewO. The only exceptions are: enterprises in the primary sector, freelancers, insurance companies and management of own assets.

[3] Administrative regions are referred to as "Landkreise" and "kreisfreie Städte".

trepreneurship. In Section 3 we discuss previous empirical evidence and derive the hypotheses to be tested. The empirical part of our paper is organized as follows: First we present a descriptive analysis of the data in Section 4. Start-up activities of ethnic minorities are characterized by their trends within the considered time frame, and by the origin of the entrepreneurs. Furthermore the geographical distribution of start-up activities is illustrated. In the second step in Section 5 we use a count data model to identify regional conditions that affect the number of start-ups of migrants on a regional level. We focus in particular on differences in the labor market situation and in structural characteristics of the population, e.g., the fraction of foreigners, the age structure, and the educational structure. Moreover we account for cluster effects of start-up activities across regions.

2 Theoretical Background

Goebel and Pries (2006) define ethnic entrepreneurship as economic activities that are adapted to specifics of ethnic minorities (e.g. preferences, resources, norms and values) through a particular business strategy, the way to produce services/goods or the business structure (Goebel and Pries, 2006, p. 261).

The question, why entrepreneurial activities of ethnic minorities are more likely to occur in some regions compared to others, leads directly to the question what determines the decision to start a business. Conceptual frameworks about ethnic entrepreneurship by Waldinger et al. (1990) and Kloosterman and Rath (2001) state that entrepreneurial opportunities are created, discovered and developed in an interplay of the supply side of the entrepreneur (e.g. personal, demographic and socioeconomic characteristics and resources) and of structural environmental conditions of the demand side (e.g. legal conditions, institutions, labor market conditions).

In the following, first we introduce person-oriented approaches that aim at explaining (ethnic) entrepreneurship. Keeping in mind, that the totality of individual start-up decisions in a particular region determines the entrepreneurial activity of the region (Wagner and Sternberg, 2004, p. 222), we look at characteristics of the pool of potential ethnic entrepreneurs in a region. Secondly environmental-oriented approaches are presented, in which the relevance of i) the integration into the regional labor market, ii) agglomeration tendencies and iii) legal conditions are illustrated. The resulting combination of the characteristics of potential entrepreneurs and the structural conditions of a region are decisive for the number of start-ups by ethnic minorities.

2.1 Person-oriented Approaches

Cultural Background. Differences in culture between ethnic minorities and the majority population are one of the main aspects in explaining ethnic entrepreneurship. One of the earliest approaches to explain ethnic entrepreneurship by cultural differences is the middleman-minority theory by Bonacich (1973). The suggestion is that if a lively entrepreneurial culture and entrepreneurial activities are highly valued in the home country, this cultural background might also enhance entrepreneurial activities of migrants in the receiving country.

The cultural background of migrants might even be an entrepreneurial advantage, when looking for economic niches (Wiebe, 1982). Examples for such entrepreneurial advantages are special knowledge about home country products and the ability to provide these goods and services due to transnational supply links.

Hofstede (1980) distinguishes in his seminal contribution five categories of cultural differences: power distance, individualism, masculinity vs. feminity, uncertainty avoidance and long-term vs. short term orientation. Vinogradov and Kolvereid (2007) relate these categories of cultural differences to the self-employment decision. The results show, that the self-employment decision is supported by a high acceptance of inequality in a society (power distance) and a high appreciation of individuality (individualism). Individuals with low uncertainty avoidance seem to be more able to cope with the challenges of self-employment, due to their higher flexibility. Moreover cultural norms and values shape social structures, values and capabilities that often support the emergence of ethnic entrepreneurship. Thus determinants of the self-employment decision and their effects might differ by nationality.

Socio-economic Characteristics. In our paper we concentrate on age and education as socio-economic determinants of the self-employment decision. Altogether, the average age of the foreign population is lower compared to Germans[4]. Moreover, there is considerable variation in the average age across regions. With respect to education, on average foreigners show a lower educational level than Germans.

The effect of age on the individual likeliness to choose self-employment is twofold: the older the prospective entrepreneur, the more (financial) resources and relevant professional knowledge he might have accumulated. But the pay-off-time of the start-up costs declines with advancing age (De, 2005, pp. 37-39). In addition the opportunity costs of self-employment are even higher in seniority-based salary systems, where an age premium is paid in dependent employment (Lévesque and Minniti, 2006). Frosch (2007) shows how age might negatively

[4]In 2005 the average age of foreigners was 37,3 years (Statistical Federal Office, 2008, p. 51) while Germans were on average 42,3 years old (Statistical Federal Office, 2008).

affect the self-employment decision. This could be due to i) a decrease in creativity and innovativeness and hence a lower chance to spot and develop entrepreneurial opportunities, ii) lower cognitive abilities, and ii) less motivation to start an enterprise because the "need of achievement" is less pronounced (Frosch, 2007, p. 4). These age effects on the self-employment decision might show up on an aggregate, regional level. Hence the age structure of a region determines the size of the pool of potential entrepreneurs.

The educational background plays one of the most important roles for the start-up decision process. Not only, that the discovery of entrepreneurial opportunities is often directly related to the professional knowledge of the prospective entrepreneur but also the implementation of business related ideas requires a wide variety of abilities. In an occupational choice model Lazear (2002) showed, that persons whose talents span a variety of different skills are more likely to choose self-employment than people with special knowledge in only a few areas. Lazear (2002) characterizes entrepreneurs as "jacks-of-all-trades" and provides empirical evidence for his propositions.

Although there is no direct link between formal educational level and the variety/depth of necessary abilities to start a business, we follow Acs and Armington (2003) and assume, that individuals with a higher educational level are more trained in assessing information and developing new ideas (Acs and Armington, 2003, p. 20) and hence more likely to detect, create and develop business opportunities.

Social Networks and Social Capital. Social networks between people are based on cultural, occupational or familial ties (Portes, 1995, p. 8). They affect entrepreneurial decisions and shape as well as create opportunities for ethnic business. Resources that depend on social networks are referred to as social capital. Portes (1995) defines social capital as follows: "Social capital refers to the capacity of individuals to command scarce resources by virtue of their membership in networks or broader social structures."(Portes, 1995, p. 12). Examples for such scarce resources are for instance information about business opportunities and business premises or loans from family members. The ability of the individual to mobilize these resources on demand is one of the crucial aspects of the social capital concept.

The role of social capital for ethnic entrepreneurs is highlighted by Light (1972) who shows the relevance of the ethnic group as a source for customers and employees. Resources that are available due to the belonging to an ethnic group are characterized by Light and Rosenstein (1995) as "ethnic resources". Examples for ethnic resources are rotating credit systems or solidarity between group members. Support by family members or members of

the ethnic group is often one of the most important success factors for start-up processes of ethnic minorities.

2.2 Environmental-oriented Approaches

Labor Market Entry. Ward and Jenkins (1984) attribute the emergence of migrant entrepreneurship mainly to the institutional, legal and social conditions in the receiving country. Particularly restrictions on the labor market and the necessity to gain alternative income drive the self-employment decision of migrants. This might be especially relevant in Germany, where the residence permit status of third-country nationals is tied to the ability to earn a livelihood. In what follows we introduce three approaches to explain barriers on the labor market due to nationality.

The *dual labor market approach* by Piore (1979) distinguishes two labor market segments: a high-wage primary segment and a low-wage secondary segment. Workers in the low-wage secondary segment have less favorable working conditions with high job-instability and rare opportunities for training or advancement. The segmentation of the labor market is mainly due to job characteristics and job access and has little to do with different characteristics of workers (e.g. human capital endowment). Discrimination occurs, because the number of jobs in the primary sector is limited and due to a lack of access workers in the secondary sector can not change sectors. Unemployment in the secondary sector is higher due to high job turnover rates. Looking at the situation on the German labor market, indicators of a segmented labor market exist. A high percentage of foreign workers is still working in manufacturing with low chances for social upward mobility.

In concept of *taste discrimination* by Becker (1957) discrimination occurs because employers prefer not to employ certain groups of workers. Employers will only hire if they are compensated by paying these workers lower wages than in general. As a result equally productive workers are paid different wages. Precondition is an uncompetitive market, as under market pressure non-discriminating firms are better off and drive discriminating firms out of the market.

In *models of statistical discrimination*, discrimination of equally productive workers is caused by asymmetric information. Asymmetric information about qualification and productivity of migrant workers prevents an easy labor market entry: while the job applicant has full information about his qualification, the employer has not. This is especially the case when qualifications are obtained abroad and formal qualification is highly valued in the host

country. If signaling mechanisms are missing, acceptance of education obtained abroad to its full extent is unlikely. Hence the payment at average productivity might be below the true productivity of the migrant. Lundberg and Startz (1998) identify two sources for asymmetric information: the availability of suitable signals and the quality of signals (Lundberg and Startz, 1998, p. 6). Hence the questions are whether the person qualifies for the job and to what extent the qualification is valued by the employer. Lundberg and Startz (1998) point out that statistical discrimination can create a self-fulfilling prophecy: faced with negative stereotypes about the productivity of ethnic minorities, the incentives to invest in human capital decrease. This results in wage and productivity differentials between nationalities (Lundberg and Startz, 1998, p. 6).

The persistence of discrimination as well as wage differentials lead to an intergenerational transmission of inequality, where the effects of past discrimination on the human capital of foreign workers show up in subsequent generations. Even though all approaches to explain discrimination assume that workers are of equal productivity, differences in productivity might also exist, e.g., caused by low language proficiency or low educational level. As a result foreigners face difficulties in competing successfully on the labor market.

Agglomeration, Co-ethnics and Cluster Effects. The majority of ethnic businesses provide products and services for local markets. In agglomerated regions with high population density the variety of tastes and the potential consumer demand is higher than in regions of more rural character. Hence economic niches for ethnic businesses can be found more easily. In high agglomerated regions there is also a close proximity to suppliers, distributors and customers as well as a pool of available employees. Apart from these advantages a higher population density is often accompanied by higher fixed costs (rents, wages) and stronger market competition.

The presence of co-ethnics is a source of support for the prospective entrepreneur, because this makes social capital more readily available for the entrepreneur.

Regional conditions for firm formation might be particularly favorably in start-up clusters. Clusters of start-ups are beneficiary for new firm formation due to knowledge spillovers, firm linkage and support structures. In case of ethnic entrepreneurs, where language barriers might exist that prevent an advice from natives, self-employed ethnic group members may be a valuable source of useful local knowledge spillovers. Moreover, a higher density of ethnic entrepreneurs might also have a motivational aspect: in the individual perception a start-up project might seem to be more feasible. The start-up cluster hypothesis is supported by

Wagner and Sternberg (2004). In their view governmental support programs that enhance local clustering in high growth areas would be more efficient than supporting firm formation activities in rural areas.

Legal Conditions. With respect to legal conditions two aspects have to be considered: firstly the conditions set by immigration law and secondly other legal requirements (e.g. for regulating market access or supporting self-employment).

EU-nationals and EFTA-country citizens face the same conditions as nationals when choosing self-employment. Special regulations apply for third-country nationals. If there is no initial duration of stay over 8 years in connection with a permanent residence status a special permission of the foreigners office is needed. This permission is granted, if the start-up is securely financed, the investment at least 500.000 Euro and if there are more than 5 jobs created.[5] An association agreement with Turkey ensures that Turkish citizens in Germany need not to fulfill these requirements. Under the principle of reciprocity for German entrepreneurs in Turkey there are no restrictions set by immigration law for Turks in Germany.

Further regulations with possible effects on self-employment of ethnic minorities were the amendment of the crafts code (1 January 2004) and the introduction of the "Ich-AG" (1 January 2003). With the amendment of the crafts code the title of master craftsman was no longer a precondition for setting up a business in various crafts. This definitely opened up business opportunities for ethnic minorities. The "Ich-AG" was a federal program to co-fund single-person-start-ups of unemployed individuals. These changes in regulation came into effect nationwide and probably do not influence regional variation of start-up activities, but of course they might affect development of ethnic minority business over time.

3 Previous Evidence

Ethnic Minority Start-ups on a Regional Level. On an aggregate level start-up activities of ethnic minorities have been a topic for scientific research particularly in the United States. Starting point was the concept of the ethnic enclave, a spatial concentration of ethnic minorities that seemed to function as an incubator for small ethnic businesses. From this perspective Light and Sanchez (1987), Razin and Langlois (1996), and Wang and Li (2007) study self-employment of ethnic minorities in urban areas.

[5]These criteria were set by an amendment to the immigration law in 2007. According to the immigration law from 2005 an investment of 1 million Euro and the creation of 10 jobs had to be provided. Before 2005, permission was mainly given at the discretion of local authorities.

In Germany environmental characteristics are mostly neglected in contributions about the individual self-employment decision of ethnic minorities (see Öztürk, 2001 as well as Constant and Zimmermann, 2006). Moreover contributions that focus on start-up activities on an aggregate level are available only for start-up activities of the majority population (Bade and Nerlinger, 2000, Fritsch and Falck, 2003, Sternberg, 2005, and Brixy and Grotz, 2006). There is hardly any information about the growing number of start-ups of ethnic minorities in Germany. Our paper is a first attempt to close this gap and gain insight about the conditions that determine the number of start-ups on a regional level.

Socio-economic Characteristics. Variations in start-up activities between regions might be caused by differences in the socio-economic characteristics of the pool of potential entrepreneurs. Microlevel studies of the individual self-employment decision identified a wide variety of relevant socio-economic characteristics, like education, age, marital status, home ownership or children (see Borooah and Hart, 1999 and Clark and Drinkwater, 2000 for the UK as well as Constant and Shachmurove, 2005 for Germany). In our study we focus on aggregate start-up-activities on a regional level. Hence we concentrate on two of the most prominent determinants of the self-employment decision: age and education. These are indicators for which data is readily available on a regional level.

Age. For Germany, it has been empirically shown that the dependency of business foundations of migrants on age is reversely U-shaped (on an individual level see Öztürk (2001), p. 122, and for the majority population see Schneider and Eichler, 2007, p. 105), i.e. start-up activities peak at a certain age. On an aggregate level we expect that the higher the average age level of the population aged between 15 and 65 the more frequent start-ups occur. Since the variance of regional average age is quite small it is questionable whether or not a decrease in start-up activities for "older" regions can be inferred from the data.

Education. The hypothesis that foreigners with a higher education choose the self-employment option more often than their less educated counterparts has been rejected for ethnic entrepreneurs in Germany by Constant and Zimmermann (2006) based on analyses of the German Socio-Economic Panel. Öztürk (2001) confirms these results based on his analysis of the self-employment decision of foreigners in the Microcensus sample. A possible explanation is that self-employment of ethnic minorities might be a possibility to exploit specific talents and qualifications that are not pictured by formal educational certificates issued in Germany. Moreover self-employment might be particularly chosen by less formal qualified and less skilled individuals with low chances on the regular labor market. The lack

of acceptance of qualifications from abroad might also be of importance (Bender et al., 2000, p. 81).

On an aggregate level the education effect on start-up activities of the majority population has been analyzed by Acs and Armington (2003). They show for the U.S. that a more extensive pool of potential entrepreneurs with a higher educational level is accompanied by higher rate of firm foundations. Brixy and Grotz (2006) confirm this result in their analysis about firm formation in Germany.

Combination of Age and Education. Instead of analyzing the effects of age and education on start-up activities separately Frosch (2007) distinguishes a direct effect of age on start-up activities and an indirect effect through age-specific sets of human capital endowment. The human capital sets of older age-groups are less favorable with respect to the propensity to become self-employed (Frosch, 2007, p. 15). Although older individuals are overrepresented in managerial occupations, their professional experience lacks variety and is often limited to one field of expertise. Moreover this expert knowledge goes hand in hand with a long firm tenure.

Social Networks and Social Capital. Socio-cultural networks and the availability of social capital play an important role for the individual self-employment decision of migrants. Distinct socio-cultural networks are particularly important for ethnic entrepreneurship with respect to firm-client relationships, and as a source for the acquirement of personnel and capital. Altogether, social networks are beneficial for ethnic minority business and enable migrants to create a competitive advantage. In case the business depends heavily on ethnic customers negative effects might arise for growth and survival of the firm due to the limited market size (Bolt et al., 1998, p. 90). Furthermore characteristics of the ethnic group determine the availability of resources for ethnic start-ups in the areas of i) human capital, ii) information, iii) financial capital, iv) social capital, and v) cultural capital (Rettab, 2001, p. 11).

Labor Market Entry. With respect to the labor market situation two aspects are relevant: the restrictions foreigners face on the labor market and unemployment as a motivation to start a business. Entry barriers on the labor market are multifaceted. Migrants often can not provide a proof of formal education, mainly because formal education in their home country is not approved in Germany (Bender et al., 2000, p. 81 and Kogan, 2003, p. 20). Empirical evidence about barriers to labor market entry and re-entry (after job loss) for ethnic minorities is provided by Seifert (2001), Goldberg et al. (1995), and Bruder and Frosch

(2006).

Employed foreigners are overrepresented in sectors that depend strongly on the business cycle, like manufacturing and construction (Seifert, 2001, p. 20). Being at the low end of jobs, the unemployment risk is high. Chances for occupational upward mobility on the labor market are rather low for foreigners (Bender and Seifert, 1996). Mobility occurs mainly in the manufacturing sector and from semi-skilled to unskilled jobs. Mobility between manual and non-manual sectors seems to be extremely rare (Bender and Seifert, 1996). A more recent study of occupational mobility by Kogan (2003) shows some occupational mobility for ethnic minorities on the German labor market between 1995 and 2000. Hereby upward and downward tendencies regarding the skill level are equally pronounced (Kogan, 2003, p. 25). Self-employment could be a way to by-pass restrictions of labor market (re-)entry and advancement.

Our analysis focuses on the regional labor market situation and on the structural characteristics of the population. In case of a weak integration of foreigners into the labor market, the unemployment level is often high. If this is associated with a higher level of start-up activities, it indicates that self-employment might be chosen as an alternative for missing employment opportunities (Audretsch et al., 2006, p. 2). In regions with high unemployment also the probability of becoming unemployed is higher. Studying the individual self-employment decision Öztürk (2001) finds that not only existing unemployment but even the threat of job loss increases the chances to choose self-employment significantly (Öztürk, 2001, p. 123).

Agglomeration, Co-ethnics and Cluster Effects. Start-ups of foreigners mainly take place in urban regions (Tödtling and Wanzenböck, 2000). In high agglomerated regions there is a higher degree of knowledge spillovers from which new firms might benefit. Bade and Nerlinger (2000) analyze the environmental conditions for start-ups on different technological levels. They identify critical agglomeration levels. Above these levels, the negative effects of agglomeration (e.g. higher rents, competition) outweigh the positive aspects (e.g. close proximity to customers and suppliers) and thus the impact of agglomeration on start-ups also exhibits a reversed U-shape.

The importance of concentrations of ethnic minorities as a source for financial and personal support for potential ethnic entrepreneurs is highlighted by Light and Sanchez (1987), Li (1993), Razin and Langlois (1996) and Wang and Li (2007) for entrepreneurship in metropolitan areas. Altinay and Altinay (2006) evaluate the determinants of ethnic minority business for Turkish entrepreneurs in the catering sector in London, UK. As one of the most important

factors for business growth in this highly competitive sector they identify the availability of co-ethnic labor. Moreover the existence of ethnic businesses attracts new settlements of co-ethnics by providing employment opportunities in a familiar cultural environment (Li, 1993, p. 322).

Wagner and Sternberg (2004) show, that start-up activities occur more frequently in urban regions with high population growth and high start-up rates in the recent past. They conclude that start-ups benefit from spatial proximity to networks and clusters of start-ups (Wagner and Sternberg, 2004, p. 235). This is confirmed by empirical evidence linking start-up activities to spatial clusters and networks (for an overview see Audretsch, 2003). The advantage from clustering gained by small firms is attributed to knowledge spillovers between firms and to the institutional basis (e.g. venture capital and business angel networks, local support programs) (Harding et al., 2001, p. 3). Acs and Armington (2003) find that start-ups are facilitated by spillovers from clusters of similar establishments, but that a relatively high intensity of other types of establishments actually discourages new service firm formation (Acs and Armington, 2003, p. 26).

Cultural Background. The extent of firm formation by ethnic groups can be associated with the cultural background. Differences in perception of bankruptcy have been found by Sahin et al. (2006) to be the cause for differences in start-up activities. The "dutch" perception of start-up-failure is that it is a personal failure and hence the chances for a start/restart are low. This has a negative impact on total entrepreneurial activity. In contrast to that entrepreneurs from Turkey judge bankruptcy rather as a misfortune. A restart after bankruptcy is quite likely and often supported by family and friends (Sahin et al., 2006, p. 11). Apart from such evidence Aldrich et al. (1984) conclude in their work on Asian business activity in Britain that external conditions are the main forces that shape ethnic entrepreneurship above any "cultural predisposition" towards self-employment (Aldrich et al., 1984, p. 205). Analyzing regional determinants of start-up activities for various nationalities poses the challenge that there might be not only differences in relevant determinants and but also in their effects on start-up activities.

3.1 Hypotheses to be tested

From our theoretical considerations and previous empirical evidence we derive our working hypotheses. Hypothesis H1 refers to *regional variation in entrepreneurial activities of ethnic minorities* and may be stated as follows.

H1: Regional conditions affect start-up activities of ethnic minorities.

1 The higher the average age of the foreign population aged 15-65 the higher the number of ethnic minority start-ups.

2 Regions with a higher share of highly educated potential entrepreneurs exhibit more firm formations.

3 The higher i) the population density, ii) the concentration of foreigners, and iii) the clustering of start-ups the higher is the number of ethnic start-ups.

4 Disadvantageous conditions on the regional labor market are followed by more ethnic start-ups.

We further suggested, that disparities in entrepreneurial activity level might be induced by cultural settings. Hence we derive hypotheses about *variations in regional determinants and their impact on the number of start-ups between nationalities.*

H2: Regional determinants differ between nationalities in their effect on start-up activities.

1 Urban agglomeration and start-up clusters are of higher relevance for non-Germans in comparison to Germans.

2 Labor market effects on start-up activities are more pronounced for foreigners.

4 Spatial Distribution of Ethnic Start-ups

We study the geographical distribution of ethnic minority self-employment in Germany and find determinants for variations in start-up activities across 440 administrative German regions. In the first part of our paper we provide an extensive descriptive overview about start-up activities of foreigners in the time period 2001-2005.

4.1 Data

We use data from the statistic of business notifications (Gewerbeanzeigenstatistik). This statistic includes information about registration and deregistration of a trade as well as information about essential modifications in a firm. According to law every permanent, planned self-employment activity, that aims on the realization of profits has to be announced

to public authorities. Exceptions from this rule are for instance firms in the sector of initial production and freelancers like medical doctors, lawyers or tax consultants.Information about the nationality of the entrepreneur is also provided. Based on this information we identify ethnic minorities. Our data refers to a time period from 2001 until 2005 and is available on a regional level.

For the multivariate analysis in the subsequent Section 5 this data is complemented by data from the Regional Statistics 2006 provided by the Federal Statistical Office and the Statistical Offices of the Länder (federal states). However, regional data for groups of different nationalities is limited to Germans and non-Germans based on the criteria of citizenship.

4.2 Time History

Our descriptive analysis supports the trend of an increasing number of business registrations among ethnic minorities. Between 2001 and 2005 the share of business registrations by foreigners on all business registrations rose from 9.6 % to 15.1 %. In 2005 about 136,900 business notifications were filed by foreigners. These are almost twice as many as in 2001 (78,400). Despite a high number of business deregistrations the number of foreign-owned businesses increases on average every year by about 26,300 enterprises.[6] The registration quota[7] of foreigners is 1.9 % and lies clearly above the German quota (1.0 %). The start-up intensity of foreigners is especially high in Eastern Germany (2.3 %). Mainly businesses of foreigners are registered in the legal form of sole proprietorship (85.8 %).

4.2.1 Origin of Entrepreneurs

About 48 % of all entrepreneurs with foreign nationality are of Turkish (23 %), Polish (16 %) or Ex-Yugoslavian (9 %) nationality. This is not surprising because 39,6 % of the foreign population in Germany are of Turkish or Ex-Yugoslavian origin (Bundesamt für Migration und Flüchtlinge, 2006, p.158). The high number of Polish entrepreneurs can be partially explained by the fact, that restrictions to free mobility of workers, for example in the construction sector, were by-passed by registering a business.

[6] It has to be noted, that deregistrations are often delayed (see Angele, 1997, p. 466). This might yield overly optimistic calculations of growth.

[7] The registration quota refers to business registrations in relation to the respective population aged between 18 and 65.

4.3 Sectoral Distribution

Start-up activities of members of ethnic minorities concentrate on "traditional" business fields, i.e. about 60 % are filed in the fields of construction, trade and hospitality. The degree of sectoral diversification varies across nationalities. While business registrations of Turks are highly diversified, business registrations of some other nationalities concentrate on only a few sectors. As an example, start-ups of Vietnamese entrepreneurs are registered mainly in the fields of retail trade (46 %) and hospitality (42 %).

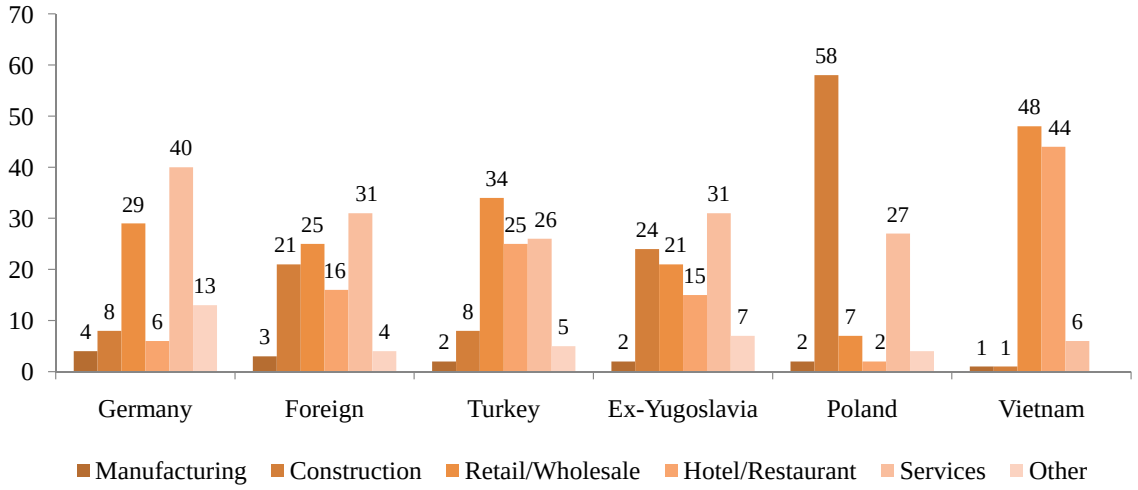
In 2005 business registrations of Germans took place mostly in the retail/wholesale and in the service sector. In comparison to natives foreigners started their businesses disproportionately often in the construction sector (21 % vs. 8 %). The huge difference of about 13 percentage points is probably due to the recent increase in business registrations by Polish that increased from 2,366 in 2002 to 35,623 business registrations in 2005. As can be seen from Figure 1 Polish registered their businesses mainly in the construction sector. Moreover foreigners are more likely than Germans to start their business in the hotel and restaurant sector (16 % vs. 6 %). Low entry barriers and potential use of resources (e.g. cultural capital, support from social networks, increased commitment to work) seem to add attractiveness to the alternative of self-employment in this highly competitive market. The disproportionately high fraction of business registrations in construction and the hotel/restaurant sector can be found in almost all single nationality profiles.

Apart from the general sectoral profile for foreigners Figure 1 provides also information about four single nationalities. For entrepreneurs from Turkey and from Ex-Yugoslavia, the sectoral distribution shows quite a high degree of diversity. In contrast to that, a high degree of concentration is shown for entrepreneurs from Poland and Vietnam. Vietnamese business registrations show an exceptionally high concentration: about 88 percent of all registrations take place in retail/wholesale or in the hotel/restaurant sector.[8]

A possible explanation is the variation in the average length of stay. For people from Turkey or Ex-Yugoslavia the average length of stay is 20.7 and 16.5 years respectively (Bundesamt für Migration und Flüchtlinge, 2006, p. 318). In contrast to that, the average length of stay for Vietnamese is about 11.7 years and lies clearly below the average duration of stay (17.3 years). However, how the duration of stay in the host country affects entrepreneurial behavior is still an open question.

[8] About 2,5 percent of all business registrations of foreigners are registered by Vietnamese.

Figure 1: Sectoral distribution of business registrations, 2005 (in percent)

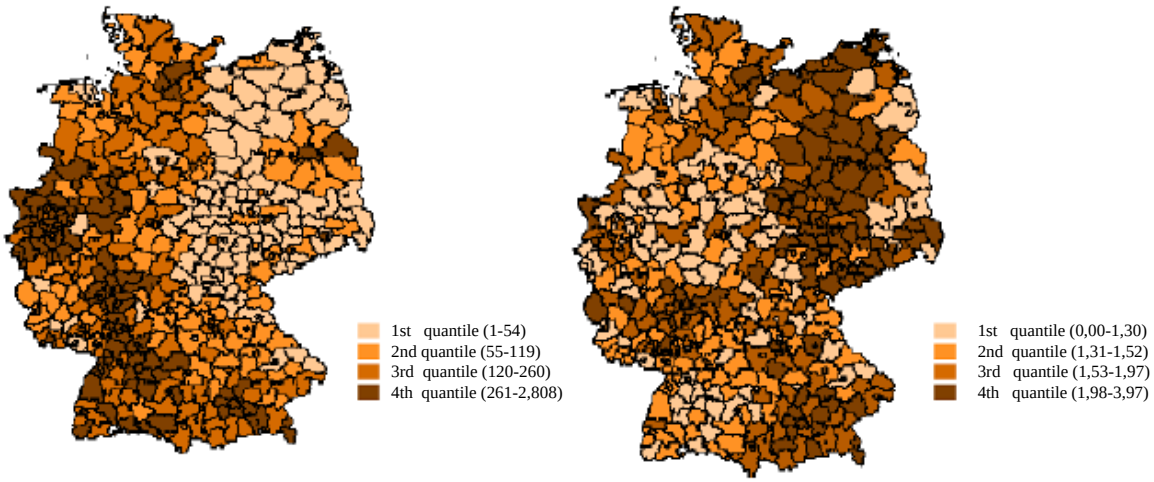


Source: Own Calculations

4.3.1 Spatial Distribution

In Figure 2a the geographical distribution of business notifications by foreigners is visualized on a regional level. Start-ups of foreigners seem to cluster and are registered most frequently in North Rhine-Westphalia, Lower Saxony, Hamburg and surroundings, in the Rhine area, and around Munich. This suggests that the entrepreneurial climate and the number of business registrations in adjacent regions are of high importance.

Figure 2: Geographic distribution of business registrations by foreigners (2005)



a) Absolute business registrations b) Start-up intensity

Source: Own Calculations

The number of start-ups in relation to the foreign population living in the respective area is pictured in figure 2b. Surprisingly, the start-up intensity is very high in Eastern Germany. Despite a very low share of the foreign population on overall population (between 1.9 and

2.8 %, Bundesamt für Migration und Flüchtlinge, 2006, p. 161), foreigners are more likely to start a business. A possible explanation is that in more peripheral and rural regions the labor market situation for foreigners is more difficult. The average unemployment quota of foreigners in Eastern Germany is about 37.7 % and 19 percentage points higher than in the Western part (Bundesagentur für Arbeit, 2007, p. 35). Hence the self-employment option may be more attractive.

In addition, we study the distribution of business registrations according to regional agglomeration levels. Agglomeration levels are measured solely by population density. As can be seen from Table 1 about 44.6 % of all business registrations by foreigners take place in regions with a very high population density. Only 36.3 % take place in rural or semi-rural regions, while this is the case for about 59.7 % of all business registrations by Germans. Obviously foreign entrepreneurs expect to be more successful in areas with an extensive consumer market that is accompanied by a high variety of tastes.

Table 1: Business registrations and regional agglomeration level (yearly average 2003-2005, in percent)

Population density (pers./sq. km^2)	nationality German	nationality non-German
below 150	25.4	11.0
from 151 up to 500	34.3	25.3
from 501 up to 1500	17.8	19.2
above 1501	22.5	44.6
total	100.0	100.0

Source: Own Calculations

5 Determinants of Regional Variation

In this section we look firstly at determinants for regional variation of start-up activities of foreigners and secondly we answer the question whether these determinants or their effect differ between Germans and non-Germans. The dependent variable of our multivariate regressions is the average number of business registrations in a region. Start-up activities of foreigners show extensive variation especially in smaller regions. To avoid estimation bias due to outliers we calculate the average number of business registrations that took place in the years 2003-2005. Data about regional conditions refers to the year 2002 to account for a time lag between self-employment decision and actual firm formation that amounts to approximately two years (Acs and Armington, 2003, p. 13). Our control variables refer to population structure, clustering of start-ups, regional labor market situation as well as

economic structure and growth. Table 2 provides an overview about our variables and their operationalization. The right column of Table 2 indicates whether the respective variable takes on nationality specific values for Germans and non-Germans or whether the value is the same for both nationalities.

Table 2: Description of variables

Variable	Definition	expected effect	nationality-specific?
dependent variable			
START_UP	average number of business registrations 2003-2005		yes
population structure			
LN_POP	overall population, logarithm	+	no
FOREIGN	share of foreign population on overall population (percent)		
URBAN	number of inhabitants per square kilometre (population density)	+	no
$URBAN^2$	population density squared	-	no
CH_POP	population growth rate (percent)	+	no
- age structure			
AGE	average age of overall population between 18-65	+	yes
OLD_REGION	dummy variable: equals 1 if average age lies above the average age of all regions; otherwise 0		yes
INT_AGE	interaction term between *AGE* and *OLD_REGION*	-	yes
- education structure			
ACADEMICS	share of employees with academic degreee on overall employees (percent)	+	yes
spatial effects			
CLUSTER	average number of business registrations in adjacent regions 2003-2005, logarithm	+	yes
regional labor market			
UNEMP	unemployment quota: share of unemployed on overall population aged 18-65 (percent)	+/-	yes
DIF_UNEMP	absolute change in unemployment quota (percentage points)	+	yes
economic structure and business cycle			
SECTOR	share of employees in manufacturing on overall employees (percent)	+	no
CH_GDP	growth rate GDP (towards preceding year, percent)	+	no

General structural characteristics of the population refer to overall population size, the presence of foreigners in the region and population density. Due to the assumed effects on the self-employment decision the age structure and educational structure of the region is included. The size of the region is captured by including the logarithm of total population. Besides the average age of overall population between 18 and 65 years a dummy-variable is calculated that indicates "older", that is above regional average, regions. An interaction effect of both variables is included to picture whether the effect of the age structure is less pronounced in "older" regions.[9] We follow Brixy and Grotz (2006) and describe the educational structure of the population by the share of highly educated employees on overall employees, because

[9]The popular approach to include age and age-squared simultaneously does not work because regional differences in average age are quite small.

data for the educational structure of overall population is not available.

The situation on the regional labor market is illustrated by the level and the change of the unemployment quota. The share of employees working in the manufacturing sector indicates the economic structure of the region, and economic growth is measured by changes in the gross domestic product.

5.1 Model Specification

Count Data Model. In our multivariate analysis of regional determinants of ethnic business firm formation we apply a negative-binomial regression model (Cameron and Trivedi, 1998, pp. 70-74), because our dependent variable, the number of business registrations, takes on only discrete, positive values. Thus our dependent variable is not normally distributed. Applying estimators relying on the normal distribution yields inefficient and inconsistent estimators (Long and Freese, 2006, p. 349). Hence the classic spatial lag and spatial error models can not be applied.

We use a negative-binomial regression model because this accounts not only for the discrete count-data nature of our dependent variable but also for existing overdispersion. Overdispersion occurs in case the variance exceeds the arithmetic mean.[10]

We apply the NB1-model by Cameron and Trivedi (1998). In this model the overdispersion parameter is constant for all observations and the variance of the dependent variable (y_i) for a given vector of exogenous variables (x_i) is calculated by $Var(y_i|x_i) = \lambda_i(1+\sigma)$ with mean λ and overdispersion-parameter σ. The regression parameters are estimated by maximum log-likelihood. A likelihood ratio test on overdispersion shows that the overdispersion parameter σ is significantly different from zero and thus overdispersion exists.

Spatial Effects. As has been shown in Figure 2a business start-ups of foreigners cluster strongly e.g. around metropolitan areas and areas with a high share of foreign population. For the number of start-ups in a region it is of relevance whether this region is part of a start-up cluster or not. In other words the number of start-ups in surrounding regions seems to matter. We control for this by taking regional effects into account.

We capture spatial effects by implementing a two-stage procedure to consider possible effects of start-up activities in adjacent regions. Firstly we establish a neighbor-matrix for each of the 440 regions. The Queen-criteria is applied, in which every region that shares a border with the respective region (even if its only of punctual nature) is referred to as

[10] Alternatively the Poisson-regression model can be used for count data. In our study this model can not be applied, because the assumption of equidispersion (mean=variance) of the data is violated.

a neighbor.[11] Secondly the average number of business registrations in adjacent regions is considered in our regression model. Moreover we control for heterogeneity between the federal states by dummy variables.

Descriptive Statistics The descriptive statistics in Table 3 provide information about non-weighted mean, median and standard deviation for all variables. In case nationality specific values enter the regression the values are shown for Germans and non-Germans.

Table 3: Descriptive statistics

variables	German			non-German		
	mean	standard deviation	median	mean	standard deviation	median
dependent variable						
START_UP	1,751.28	2,122.48	1,247.50	259.26	650.52	113.00
population structure (identical values for both groups)						
		mean	standard deviation			median
LN_POP		11.89	0.63			11.81
CH_POP		-0.02	0.78			0.19
URBAN		510.91	654.34			200.51
$URBAN^2$		690,825.30	1,750,619.80			40,205.59
population structure (nationality-specific values)						
FOREIGN				6.96	4.75	5.88
- age structure						
AGE	42.08	0.65	42.13	37.48	1.46	37.77
OLD_REGION	0.54	0.50	1.00	0.60	0.49	1.00
- education structure						
ACADEMICS	7.95	3.88	7.11	9.30	9.72	5.47
spatial effects						
CLUSTER	7.42	0.55	7.32	5.08	1.11	5.01
regional labor market						
UNEMP	8.76	4.30	7.19	8.80	3.07	8.27
DIF_UNEMP	0.46	0.42	0.47	0.58	0.94	0.63
economic structure and business cycle (identical values for both groups)						
		mean	standard deviation			median
SECTOR		27,54	11,14			26,34
CH_GDP		1,83	3,42			1,74

Source: Own Calculation

Looking at the descriptive statistics, three aspects are striking. Firstly the foreign population between 18 and 65 is on average significantly younger than the German population. Moreover, the region that exhibits the highest average age for the foreign population is still younger than the region with the lowest average age for Germans. Secondly the share of highly educated foreign employees is on average 9,3 % while the respective share for Germans lies below that. This can be explained by regions in East Germany where employment of highly skilled foreigners was enforced and foreign overall population is still extremely small. Because these regions enter the calculation of mean unweighed, this is followed by a high value for average share of academics on employees. Also due to showing unweighed means, the difference in

[11] Alternative contiguity criteria are the Rook criteria, (regions with punctual borders are not included) and distance-based methods for creating spatial weights. For details see (Anselin, 2003, p. 93).

unemployment quotas is quite small (0,03 percentage points). Calculating means weighted by population shows that the average share of academics is lower for foreigners (7.6 %, Germans: 8.9 %) and the average unemployment quota is higher in the case of foreigners (9.2 % compared to 8.5 %).

5.2 Regression Results

We test to which extent regional variation in the number of business registrations can be attributed to regional conditions. Moreover we are interested in whether the relevant determinants and their impact on start-up activities differ between nationalities.

5.2.1 Findings on Regional Variation

Population Characteristics. The right part of Table 4 shows the analysis of regional variation in start-up activities for non-Germans. We concentrate on this results when discussing the findings on regional variations.

Age. The estimated parameter for average age shows the expected positive sign. The hypothesis that regions with higher average age show higher numbers of business registrations is confirmed. In the case of non-Germans the interaction effect of average age and the dummy-variable for regions above the average is significant and positive. Hence there is no evidence that the impact of age-structure on entrepreneurial activity decreases in particularly "older" regions.

Education. A higher share of academics on overall employees does not affect the number of start-ups. An explanation could be, that these indicator pictures the degree of integration of highly educated foreigners in the labor market. Thus for highly educated foreigners the need to seek alternative income in self-employment might be lower.

Labor Market. In contrast to our expectations regions with high unemployment quotas among foreigners do not differ from regions with low unemployment in terms of start-up activities. Maybe the entrepreneurial climate (e.g. availability of resources, start-up support) is worse in regions with a high unemployment rate or high unemployment coincides with unfavorable characteristics of the pool of potential entrepreneurs (e.g. low entrepreneurial knowledge, high risk aversion, low entrepreneurial motivation). What matters instead is the change in unemployment. Regions with high short-term unemployment (below one year) show significantly more business notifications. We tentatively conclude that unemployed with a short duration of unemployment seem to be a source for entrepreneurs.

Table 4: Estimation results

variable	nationality German					nationality non-German				
	coeff.		std.-dev.	semi-el.	stand. semi-el.	coeff.		std.-dev.	semi-el.	stand. semi-el.
LN_POP	1.009	***	0.011		87.2	1.021	***	0.021		89.6
FOREIGN						0.068	***	0.004	7.0	38.0
URBAN	0.002		0.003	0.2	1.4	0.030	***	0.005	3.0	21.5
$URBAN^2$	−0.000		0.000	−0.0	−2.4	−0.001	***	0.000	−0.1	−10.8
CH_POP	0.097	***	0.013	10.1	7.8	0.178	***	0.029	19.5	14.7
AGE	0.071	***	0.012	7.4	4.7	0.052	***	0.017	5.3	7.8
INT_AGE	−0.001	***	0.0004	−0.1	−2.0	0.002	**	0.001	0.2	4.5
ACADEMICS	0.004	*	0.002	0.4	1.3	0.004		0.002	0.4	3.8
CLUSTER	0.030	**	0.014		1.7	0.064	***	0.015		7.5
UNEMP	−0.031	***	0.004	−1.3	−5.6	0.005		0.005	0.5	1.4
DIF_UNEMP	0.060	***	0.015	6.2	2.6	0.035	*	0.195	3.5	2.8
SECTOR	−0.004	***	0.001	−0.4	−4.6	−0.005	***	0.001	−0.5	−5.8
CH_GDP	0.001		0.002	0.1	0.4	−0.005		0.003	−0.5	−1.6
Constant	−7.756	***	0.523			−10.379	***	0.673		
Observations	433					431				
Log Likelihood	−2,741.20					−2,103.59				
Pseudo R^2	0.24					0.25				
LR Chi^2	1722.09					1437.33				
Prob. Chi^2	0.00					0.00				
significance level:	$*$: 10%		$**$: 5%		$***$: 1%					

Source: Own Calculation

Agglomeration, Co-ethnics and Entrepreneurs. The estimated parameters for population density (*URBAN*) were positive as expected and confirmed the results of the descriptive analysis. We estimate a strong positive effect on the number of start-ups. In regions with very high population density this effect is slightly diminished. Looking at the coefficient for the share of foreigners on overall population we find a positive impact as expected. It also matters, whether a region happens to be surrounded by regions with high start-up activity. The existence of a cluster promotes start-ups by foreigner strongly.

Control Variables. The estimated coefficients of the control variables for population growth (*CH_POP*), and for economic structure (*SECTOR*) show the expected impact on start-up activities and are significant. Differences in economic growth (*CH_GDP*) do not account for regional differences in firm formation.

5.2.2 Findings on Differences between Nationalities

Our analysis shows differences between nationalities with respect to the direction of effects, the relevance of effects and the size of effects that regional conditions have on the number of business registrations.

While "older" regions (with respect to peoples age) do not differ from "younger" regions

in terms of start-up activities in the case of foreigner, this is not confirmed for Germans. Here "older" regions show significantly less firm formations. This difference in the direction of the effect could be due to a lower average age of the foreign population in general. A decrease in start-up activity might not yet be relevant. Another example for divergence in the direction of effects is the unemployment quota which is insignificant for foreigners but a highly significant negative determinant for start-up activities of Germans.

Moreover the relevant regional conditions for start-up activities are not the same for both nationalities. A high degree of agglomeration ($URBAN$) is of relevance for start-up activities by foreigners but not in the case of Germans. Here the multivariate analysis confirms the descriptive results where Germans prefer mainly regions with low population density (up to 500 inhabitants per square kilometers) while foreigners concentrate on highly populated areas (see Table 1). The effect of the educational variable was not significant for foreigners, while for Germans we detect a weakly significant effect.

To compare the relative importance of the effects we calculate standardized semi-elasticities, that are shown in the last columns of each group in Table 4. For semi-elasticities we calculate the relative variation of the dependent variable due to a standard-deviation-change of the exogenous variable (see Cameron and Trivedi, 1998). Key variables for explaining regional variation in start-up activities of foreigners are changes in population (CH_POP), the share of foreigners on overall population ($FOREIGN$) and the regional agglomeration level ($URBAN$ and $URBAN^2$). This is in contrast to the main determinants of German start-up activities which are the level of unemployment ($UNEMP$), the age structure (AGE and INT_AGE) and also changes in population (CH_POP). These results are robust to a wide variety of empirical model specifications.

5.2.3 Evaluation of Hypotheses

Starting from theoretical considerations and empirical evidence about the determinants of ethnic entrepreneurship we stated hypotheses i) about the causes of regional variations in start-up activities across regions and ii) about differences in regional start-up determinants between the nationalities German and non-German. Our hypothesis that regional conditions affect start-up activities of ethnic minorities is confirmed. We found that age effects are relevant, but that the educational structure does not account for regional differences in the number of firm formations by ethnic minorities. Furthermore our data suggest that firm formation is favored in regions with a high degree of agglomeration and a high concentration

of foreigners. Moreover, it is important that the region belongs to a start-up cluster and is surrounded by regions with a high number of business registrations. Our hypothesis that disadvantageous conditions on the regional labor market support start-up activities is rejected. Only regions with a high short-term unemployment show a significantly higher number of firm formations.

Regarding differences between nationalities we showed that regional determinants differ between nationalities. However, our data set does not support strong labor market effects for the group of foreigners as was expected. The results of the descriptive and of the multivariate analyses confirm our hypothesis, that urban agglomeration and start-up clusters are more relevant for non-Germans than for Germans.

6 Conclusions

The main focus of this paper is the relationship between regional conditions and the number of start-ups by ethnic minorities in Germany. In our paper we provide an overview about start-up activities of ethnic minority groups in Germany between 2001 and 2005. We investigate the geographical distribution of entrepreneurial activities of migrants, identify relevant fields of business, and describe differences between nationalities. As a result, the regional extent and relevance of start-ups of foreigners becomes evident. In a multivariate analysis we identify critical regional factors for ethnic entrepreneurship and examine differences between the nationalities German and non-German. We show, that there are differences in the relevance of regional conditions and in their effect on the number of start-ups. Particularly challenging was the implementation of regional effects in a regression model, that is able to account for the count data nature of our variables. Firm formation of ethnic minorities is promoted by a high agglomeration level, a high share of foreigners on overall population and high population growth.

Our analysis of regional determinants of the entrepreneurial decision indicates the somewhat limited extent of public policy to influence regional start-up numbers, that are mainly determined by structural population characteristics. In addition, short-term unemployment seems to favor self-employment. Hence counseling activities for nascent entrepreneurs should be initiated as soon as possible after job loss.

Moreover we find a pronounced degree of regional clustering of start-up activities. Further research should focus on a detailed analysis of nationality specific start-up clusters and concentrate on identifying the causes for clustering. Surveys indicate that start-up consulting

often does not meet the requirements of ethnic entrepreneurs, e.g., due to communication problems, special needs of ethnic minority entrepreneurs (Bruder, 2008, p. 117-120). This might cause nascent entrepreneurs to seek advice from family members or self-employed co-ethnics and thus firm formation by ethnic minorities is more likely to occur in regions with a high concentration of ethnic entrepreneurs and foreigners. Our results suggest that entrepreneurial focused training and education will be most successful in areas, where foreign entrepreneurs are already active.

Altogether the findings of our pilot study support some of the hypotheses raised by the ethnic entrepreneurship literature and show the differences in regional determinants between Germans and non-Germans. Our study emphasizes the importance of local factors and contributes to the progress in our understanding of new firm formation of ethnic minorities.

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